

[54] **MULTIPLE ACCESSORY ATTACHMENT FOR LADDERS**

[75] Inventor: **Roger P. Rehm**, Orrville, Ohio

[73] Assignee: **Bauer Corporation**, Wooster, Ohio

[22] Filed: **Sept. 13, 1973**

[21] Appl. No.: **396,825**

[52] U.S. Cl. **182/107, 182/111, 182/206, 182/214**

[51] Int. Cl. **E06c 7/42, E06c 1/36**

[58] Field of Search **182/107, 108, 214, 206, 182/194, 111, 109; 248/210, 211**

[56] **References Cited**

UNITED STATES PATENTS

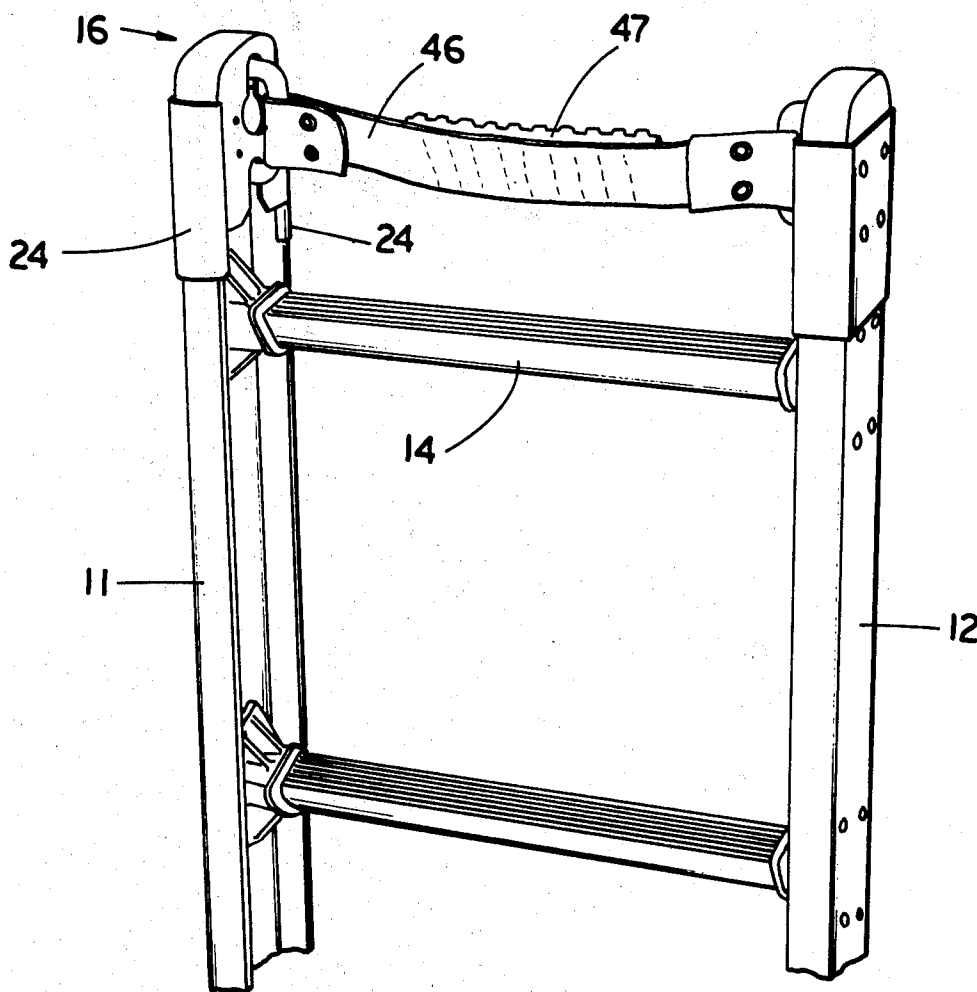
1,994,369	3/1935	Risser	182/107
2,100,918	11/1937	Ringman	182/107
2,256,452	9/1941	Marshall	182/214
3,407,900	10/1968	Hopfeld	182/107
3,715,012	2/1973	Perry	182/214

Primary Examiner—Reinaldo P. Machado
Attorney, Agent, or Firm—Woodard, Weikart, Emhardt & Naughton

[57] **ABSTRACT**

Top end caps are fixed to side rails of a ladder, each end cap having a pair of linearly aligned longitudinal slots therein, each slot having a closed upper end and an enlarged entrance at its lower end. A spring loaded latch is provided at the entrance of the lower slot and normally closes the entrance, but is resiliently deflectable to open the lower slot entrance and admit the lug of an accessory, to thereupon return to closing position and preclude separation of the accessory from the cap assembly. Various accessories are provided with end lugs and shafts extending therefrom and spanning the space between side rails by rigid or flexible means, to facilitate various types of positioning of the upper ends of ladders.

23 Claims, 7 Drawing Figures



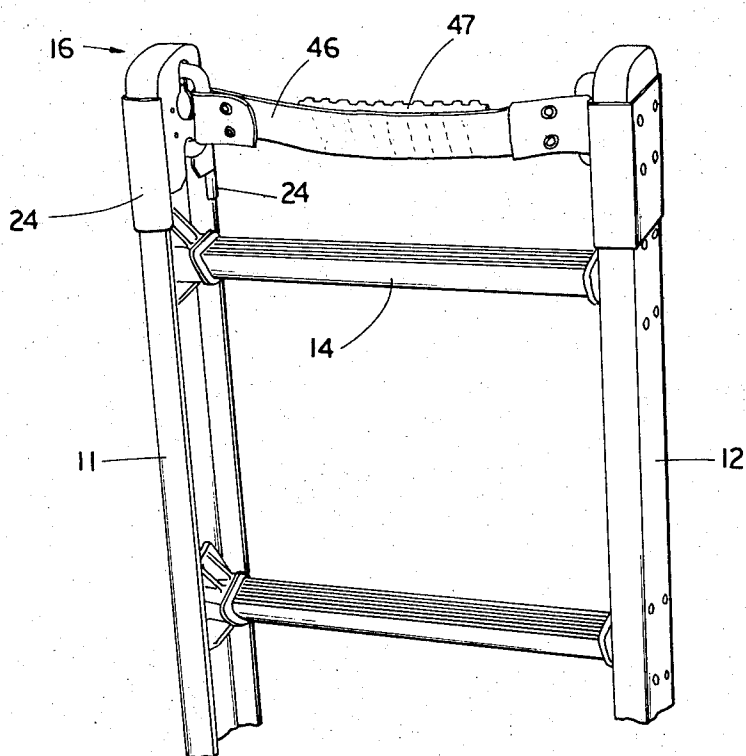


Fig. 1

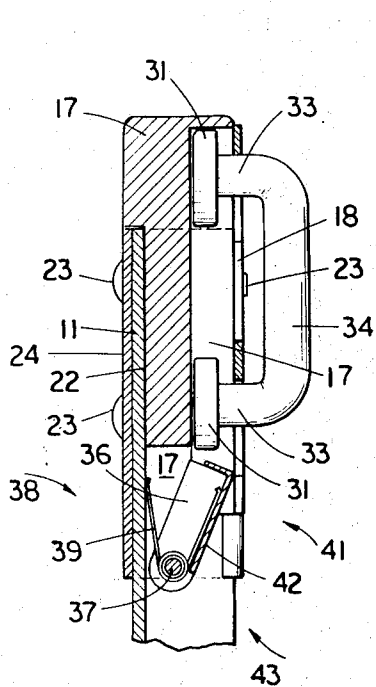


Fig. 2

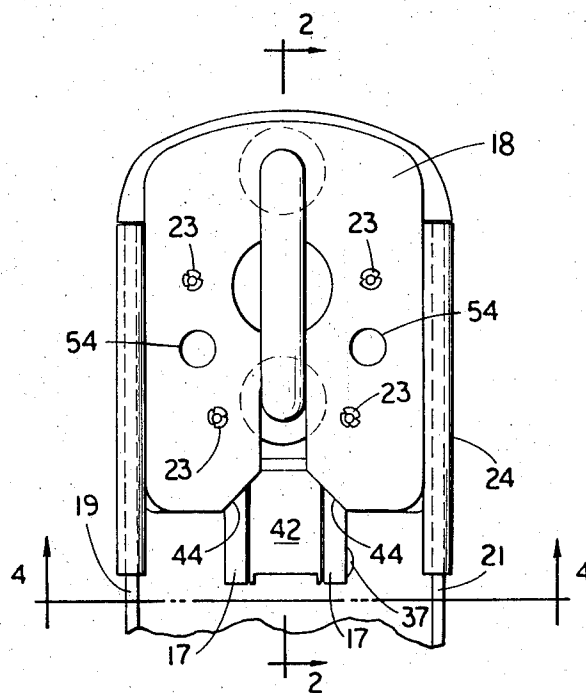
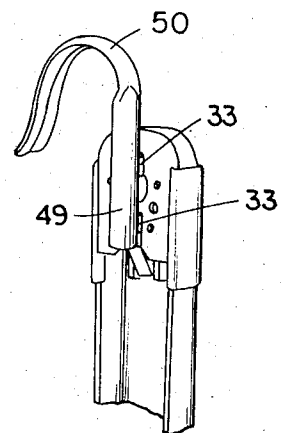
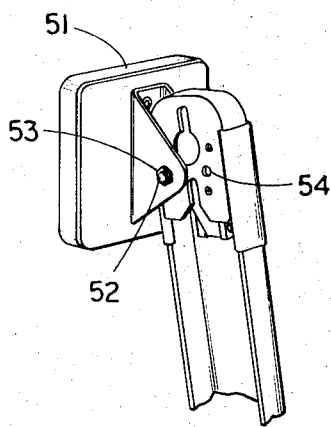
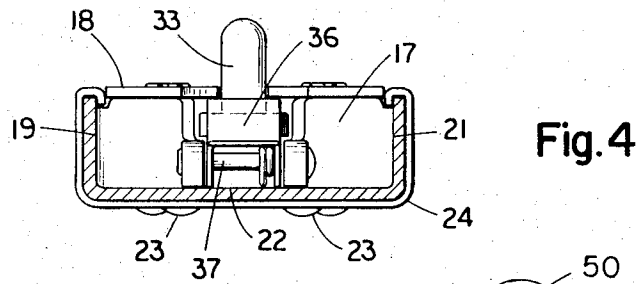
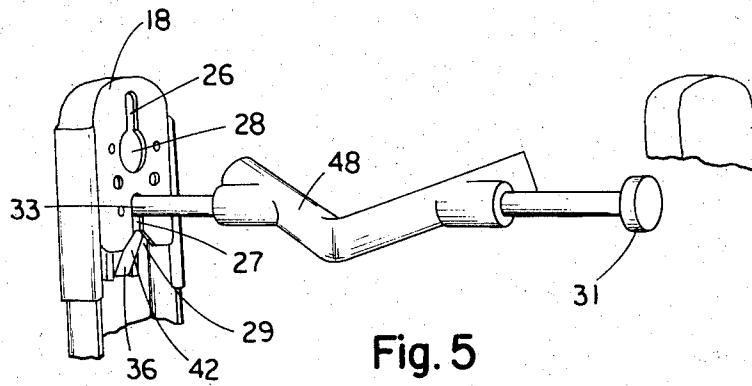


Fig. 3



MULTIPLE ACCESSORY ATTACHMENT FOR LADDERS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to ladders and attachments for the upper end thereof, and more particularly to means facilitating a variety of adaptations of ladders.

2. Description of the Prior Art

Because of the variety of types of work for which ladders are used, various types of devices have been conceived for attachment to the upper ends of ladders for particular types of positioning. For example, a U.S. Pat. to Risser, No. 1,994,369 shows a so-called pole gripper for ladders, which is a type of self-centering rung to facilitate location of the upper end of a ladder against a pole. Another device for engaging a pole is shown in the Hopfeld U.S. Pat. No. 3,407,900. Such devices are also sometimes known as ladder lashes, and can be made long enough to completely encircle a pole.

Another device used at the upper ends of some ladders is a hook. Some of these are permanently affixed in place, and others can be made to retract and fold when not in use, as disclosed in the U.S. Pat. No. 1,205,594 to E. E. Close. Another type of device for the top end of a ladder is a non-marring bumper and such is shown in U.S. Pat. No. 2,925,877 to Wright. That patent also shows a type of strap engaging a post, the strap being connected between the side rails of the ladder at the top end.

Heretofore, it seems that because of the comparative permanence of attachment of such devices to ladders, some ladder users carry additional ladders for different types of upper end connections or positioning. Because of the space and weight requirements of additional ladders, we have sought to provide greater adaptability of a given ladder to various types of top end resting, locating, securing, and positioning possibilities and situations. The present invention is the result of our efforts along these lines.

SUMMARY OF THE INVENTION

Described briefly, in a typical embodiment of the present invention, top end cap means are affixed to side rails of a ladder, the end cap means including movable latch means normally closing a portion of a socket for a lug provided on an accessory or accessory attachment. The latch is provided with a cam surface to facilitate installation of the attachment, but an abutment surface on the latch precludes removal other than by intentional manual operation of the latch. The particular type of accessory may involve a second lug for which a second socket is provided in the end cap, and the spacing of lugs and socket entrances is such as to preclude removal of the lug from one socket without removal of the other lug from the socket closed by the latch.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a ladder assembly incorporating a multiple accessory attachment combination according to a typical embodiment of the present invention.

FIG. 2 is a section through the assembly on one side rail showing interior details.

FIG. 3 is a view from between the side rails, looking outwardly toward one of the assemblies.

FIG. 4 is a section taken at line 4—4 in FIG. 3 and viewed in the direction of the arrows.

FIG. 5 is a fragmentary perspective view showing a self-centering rung mounting.

FIG. 6 is a fragmentary view showing a strand hook mounting.

FIG. 7 is a fragmentary view showing a wall-protector mounting.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings in detail, and particularly FIG. 1, the ladder includes a pair of side rails 11 and 12 which may be fiberglass reinforced plastic material of channel-shaped cross section. An end cap assembly is affixed to the top of each side rail above the uppermost ladder rung 14. The end cap assembly 16 includes the cap body 17 and plate 18. As is better shown in FIG. 4, the cap body has a pair of parallel walls 19 and 21 and a wall 22 between them, these walls respectively and fittingly receiving the three walls of the channel of the ladder side rail. The end cap body and plate 17 and 18, respectively, are affixed together with the side rail by means of four rivets 23. The edges of the side rails are covered and protected by the reinforcement sleeves 24. These sleeves, typically made of aluminum extrusions of cross-sectional shape best shown in FIG. 4, are slid onto the side rails 11 and 12. Then the end caps are located in the ends of the side rails; the sleeves are slid up into place around them; and the assembly is riveted together.

As is perhaps best shown in FIG. 5, there are two slots 26 and 27 in the plate 18. These are elongated, extending in line with each other and are closed at their upper ends. Slot 26 has an enlarged opening 28 at the lower end thereof, and slot 27 also has an enlarged opening 29 at the lower end thereof. These provide entrances for lugs or heads such as discs 31 (FIG. 2) on the ends of shank portions 33 of a C-shaped bracket 34. A latch 36 is pivotally mounted on a pin 37 to the body portion 17 and is urged outward in the direction of arrow 38 by the spring 39. In this normal position of the latch, it closes the lower end of the slot 27 and the socket provided by the combination of the plate 18 and the cap body 17 for the lower lug 31 of the bracket 34. Because the spacing between the lugs is the same as the spacing between the entrance ends of the slots, so long as the latch 36 confines the lower lug in its respective socket, the upper lug is confined in its respective socket. Therefore the bracket cannot come out of the assembly unless the latch 36 is forced inwardly by application of manual force in the direction of arrow 41 to push the latch to a release position opening the lower end of the lower socket to permit removal of the bracket therefrom. It will be noted in FIG. 2 that the upper end of the latch provides an abutment surface precluding departure of the bracket therefrom, whereas the surface 42 of the latch is disposed at a slight incline whereby it facilitates entrance of the lug into the socket in the direction of arrow 43 for installation of the bracket. Also, the tapered entrance edges 44 at the lower end of the lower slot 27 facilitate installation. The same arrangement as described above for the C-shaped bracket is employed in the other top end cap assembly and the ladder lash is secured to the two

brackets. This ladder lash is a flexible non-extendable strap 46 in the illustrated embodiment including on its one side a corrugated contact member 47 to engage a post.

In the embodiment of FIG. 5, the same lug and shank 33 are used as in FIG. 2, but the shank is extended into a combination V-shaped member 48 which serves as a self-centering rung. This is facilitated by the fact that the shaft 33 is circular in cross section, as is the lug 31 which is actually a circular disc as shown at the outer end of the self centering rung in FIG. 5. This outer end is, of course, received in the other ladder top cap assembly in the same manner as the one illustrated by the solid lines.

The embodiment of FIG. 6 shows a strand hook 50 which has a couple of discs and shanks on the straight portion 49 thereof at the same spacing as the discs and shanks 33 of the bracket 34 of FIG. 2. Therefore this strand hook is mounted in the same way as are the C-shaped brackets 34, one hook being mounted to each side of the ladder.

FIG. 7 shows a wall protector 51. This is not mounted in quite the same way, it being mounted instead to a bolt 52, extending entirely through the cap assembly and ladder side rail and secured by means of a nut 53 on the inner end. To facilitate installation of such bolts, apertures such as 54 are provided through the end cap body and plate.

It will be seen that the present invention provides a convenient means for attaching a variety of accessories to the top end of a ladder. The surface 42 of the latch, disposed at an angle, cooperates with the head of the accessory to act as a cam follower urged to the release position of the latch, by the head of the accessory as it is pushed upward in the direction of arrow 43 (FIG. 2) into its socket. On the other hand, the angle of the upper end of the latch is so steep, with respect to the direction the accessory head must move to remove it, that it serves as an abutment. Also, as best shown in FIG. 2, the entire latch is recessed with respect to plate 33, to minimize chances of it being inadvertently released.

The invention claimed is:

1. In a multiple accessory attachment for ladders, the combination comprising:
 - mounting means securable to a ladder side rail and having socket means therein;
 - latch means movably mounted to said mounting means and including a latch normally disposed in a first position forming a movable wall of said socket means, said latch being movable to a release position away from said socket means to provide access to said socket means for an accessory connector.
2. The combination of claim 1 wherein:
 - said latch means include resilient means biasing said latch to said first position.
3. The combination of claim 1 wherein:
 - said socket means include first and second sockets, said first socket having an entrance at least partially closed by said latch when disposed in said first position.
4. The combination of claim 3 wherein:
 - said second socket has an opening comprising a narrow elongated slot having an enlarged entrance end for an accessory connector.
5. The combination of claim 4 wherein:

said first socket has an opening comprising a narrow elongated slot and an entrance end for an accessory connector, said latch in said first position closing the entrance end of said first socket.

6. The combination of claim 5 wherein:

said mounting means is a ladder end cap, having means for covering the end of a ladder side rail, said slots being aligned, and the entrances thereof being disposed in a direction which, with reference to the respective slots thereof, is opposite the direction of the ladder end covering means.

7. The combination of claim 6 wherein:

said cap has three siderail locating surfaces; said end covering means include shoulders projecting outward from said locating surfaces; and said slots are on a fourth surface parallel to one of said locating surfaces.

8. The combination of claim 7 wherein:

two of said locating surfaces are in planes parallel to each other and the third of said surfaces is in a third plane perpendicular to said parallel planes.

9. The combination of claim 8 and further comprising:

a ladder side rail having a channel shaped cross section fittingly received on said locating surfaces, with the end of said side rail abutting said shoulders.

10. The combination of claim 1 and further comprising:

accessory connector means including a head received in said socket means, and a shank extending from said head out of said socket means, said latch retaining said head in said socket means when said latch is in said first position, and said head being removable from said socket means by passing said latch when said latch is in said release position.

11. The combination of claim 10 and further comprising:

a ladder rung having an end joined to said shank, and having a generally V-shaped portion for centering thereof against a pole or the like.

12. The combination of claim 10 wherein:

said socket means include first and second sockets, said first socket having said connector head therein and having an entrance at least partially closed by said latch when disposed in said first position, said latch precluding departure of said connector head from said first socket;

said second socket having a wall opening comprising a narrow elongated slot having an enlarged entrance end for an accessory connector; and

said connector means further includes a second head received through said enlarged entrance end of said second socket and retained in said second socket, and said connector includes a second shank extending from said second head out of said second socket through said slot thereof and joined to the first mentioned shank of said connector.

13. The combination of claim 12 wherein:

said first socket has a wall opening comprising a narrow elongated slot extending to said entrance, said slots extending in the same direction from their respective entrances;

said connector heads and slot entrances have the same spacing whereby they are simultaneously receivable in their respective entrances and linearly movable therefrom lengthwise of said slots into

their respective ones of said first and second sockets and thereupon retained therein by the slotted wall portions and by said latch.

14. The combination of claim 13 and further comprising:

strand hook means joining the shanks of said first and second heads of said connector means, and extending therefrom to a hooked portion thereof.

15. The combination of claim 13 wherein:

said shanks are joined by a C-shaped bight portion, and a ladder lash strap is attached to said bight portion.

16. The combination of claim 15 wherein: said heads are circular discs.

17. The combination of claim 1 and further comprising:

a ladder having a pair of side rails and a plurality of shaped parallel rungs disposed between said side rails and affixed thereto,

said mounting means being affixed to one of said rails, and said latch being exposed for access from the space between said rails;

second mounting means affixed to the other of said rails and having socket means therein and latch means thereon including a latch normally disposed in a first position forming a movable wall of said socket means and being movable to a release position to provide access for an accessory connector, the latch of said second mounting means being accessible from the space between said rails; and

accessory means for locating the ladder on an external object and including lugs received in said socket means and retained therein by said latches.

18. The combination of claim 17 wherein:

said socket means in each of said mounting means have slotted openings on walls thereof facing each other across the space between said side rails, one of said slotted openings of said socket means having an entrance at one end and closed at the other end, with the said latches of each of said mounting means normally closing the entrance of the slotted opening and retaining said lugs therein.

19. The combination of claim 18 wherein:

each of said socket means includes two sockets, said latch closing the entrance of one of the two sockets, and said slotted openings include two slots, one slot in a wall of each of the sockets; and

said accessory means include two members, each having two of said lugs thereon having the same spacing therebetween as the spacing between the entrances of the two slots of the mounting means whereby the lugs on a member are simultaneously receivable in the slot entrances and retained in the respective slots by the slotted walls thereof and by the latch closing the entrance of one of the two sockets.

20. The combination of claim 19 wherein: the members are strand hooks.

21. The combination of claim 19 wherein: the members are brackets, and

a flexible, non-extendable, ladder lash extends between the brackets.

22. The combination of claim 19 wherein:

said mounting means are caps affixed to and covering the ends of said ladder side rails.

23. The combination of claim 19 wherein:

said latch is recessed with respect to the slotted wall of said sockets.

* * * * *

40

45

50

55

60

65